

Description of five new species of *Holoparasitus* s. str. with redescription of *H. apenninorum* (Berlese, 1906) and *H. cultriger* (Berlese, 1906) from Italy and Spain (Acari, Gamasida, Parasitidae)

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Description of five new species of *Holoparasitus* s. str. with redescription of *H. apenninorum* (Berlese, 1906) and *H. cultriger* (Berlese, 1906) from Italy and Spain (Acari, Gamasida, Parasitidae). - The specimens included under the name of *H. apenninorum* (Berlese, 1906) in the Berlese collection in Florence are reviewed and a lectotype for *H. apenninorum* is designated. Five new species, *H. cornutus* sp. n., *H. crassisetosus* sp. n., *H. digitiformis* sp. n., *H. ellipticus* sp. n., *H. gibber* sp. n. are described and *H. cultriger* (Berlese, 1906) is redescribed, all from material from Italy and Spain. The characteristics of a new species group *mallorcae* is given.

Key-words: Acari - Gamasida - Parasitidae - *Holoparasitus* - taxonomy.

INTRODUCTION

The gamasids belonging to the genus *Holoparasitus* Oudemans, 1936 are free living, ground inhabiting predatory mites, distributed in the Holarctic region. This genus comprises 34 species which are divided, accordingly to Juvara-Bals (1975) and Hyatt (1987), into three subgenera: *Holoparasitus* s. str. (30 species), *Heteroparasitus* Juvara-Bals, 1975 (3 species) and *Ologamasiphis* Holzmann, 1969 (1 species).

In the subgenus *Holoparasitus* s. str., Micherdziński (1969) distinguished two species-groups: *calcaratus* and *pollicipatus*-groups, whereas the remaining species are considered as *incertae sedis*. Juvara-Bals (1975) proposed another group of species, named *caesus*-group. More recently Hyatt (1987) mentioned only the species-groups recognized by Micherdzinski and designated a neotype for *H. calcaratus* (C.L. Koch, 1839), the type species of genus *Holoparasitus*.

During the last decade new taxa have been identified in the course of faunistic and ecological programs or from acarological collections (Schmölzer, 1991, 1995a, 1995b; Vinnik, 1994; Witaliński, 1994a, 1994b; Juvara-Bals, 1995). As mentioned above, *Holoparasitus* s. str. includes now 30 species. Unfortunately, some of these

species are known incompletely (one sex only) and their descriptions frequently lack details. This rather large subgenus strongly requires a phylogenetical analysis. However, it cannot be successfully done until the following problems are still unsolved:

- the revision of the species deposited in the collections of the Berlese, v. Vitzthum and Willmann;
- the re-examination of some key morphological characters omitted in early descriptions in some species;
- a more complete documentation about the gamasid mites in many European regions, especially those from south-east and central Europe, is available.

The aim of this paper is to advance the knowledge of species included in the subgenus *Holoparasitus* s. str. as defined in Juvara-Bals (1975). A revision of specimens labelled as *H. apenninorum* (Berlese, 1906) in the Berlese collection ("Berlese Acaroteca", Florence, Italy) showed that this is a complex of four species: one of them we have identified as the nominal species while the three others are new species. We also describe two additional new species from Spain and Sicily, *H. gibber* sp. n. and *H. ellipticus* sp. n., respectively. These latter species form together with *H. siculus* (Berlese, 1905), *H. mallorcae* Juvara-Bals, 1975, *H. lawrencei* Hyatt, 1987 and *H. maritimus* Hyatt, 1987, a well defined group of species which we named *mallorcae*-group. Additionally, we redescribe the male of *H. cultriger* (Berlese, 1906) based on the single type specimen in the Berlese Acaroteca.

MATERIAL AND METHODS

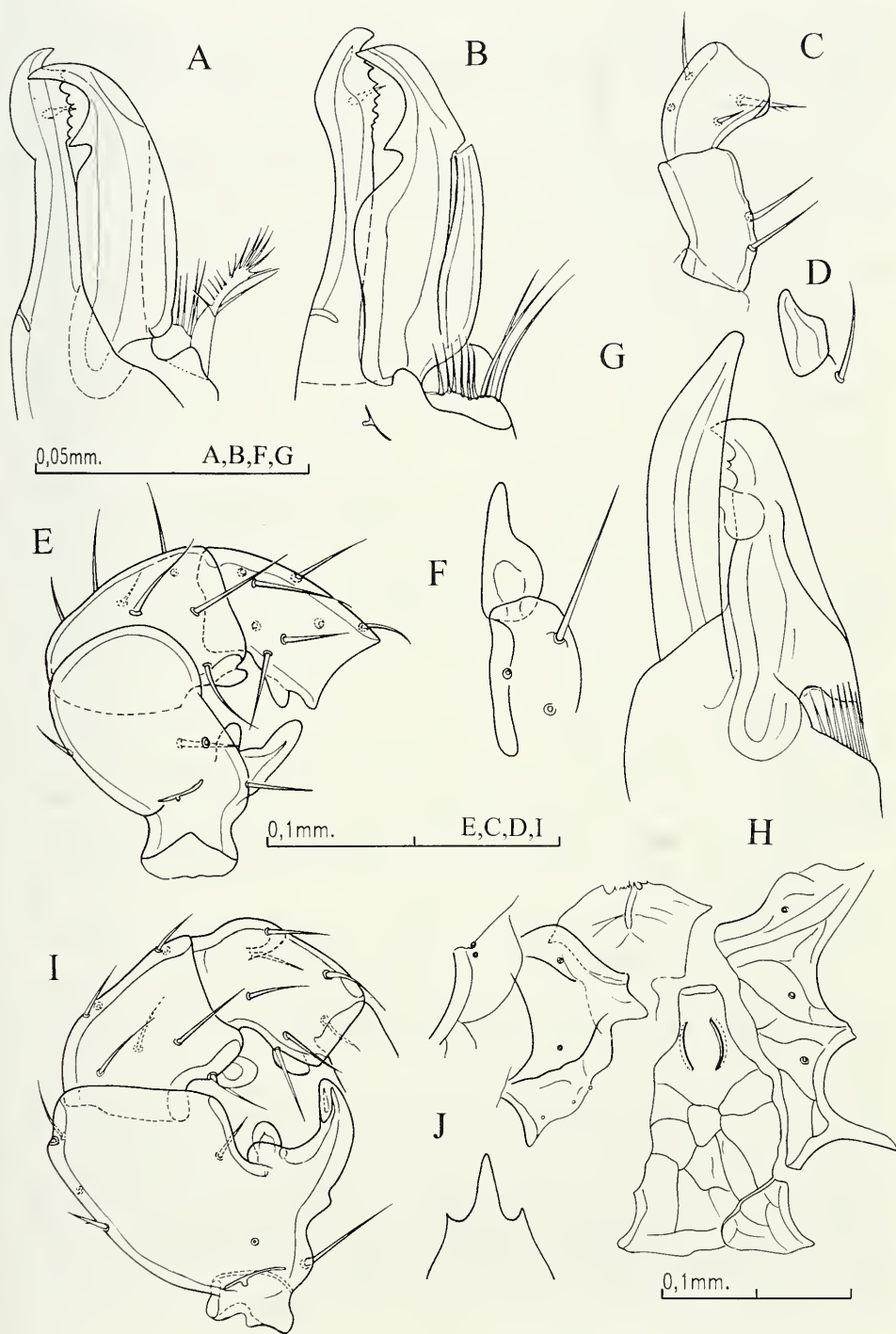
The material comes from Italy and Spain. One of us (WW) was provided with a large collection of samples from Italy collected by Prof. R. Dallai and the staff of the Department of Evolutionary Biology, University of Siena, Italy (DEBS). Juvara-Bals had the opportunity to identify samples of mites (family Parasitidae) from Italy (Toscana) collected by Dr. F. Pegazanno and Dr. R. Nannelli from the Experimental Institute of Agricultural Zoology (EIAZ), Florence, Italy. She was also working on the genus *Holoparasitus* from the Athias-Henriot collection deposited in the Museum of Natural History (MHNG), Geneva, Switzerland.

We studied material from the Berlese Acaroteca (EIAZ) which contains several species collected generally around Florence (Toscana) and in Umbria.

Morphological terminology follows mainly Evans and Till (1979) and Van der Hammen (1980). Setal notation for the idiosoma follows Lindquist and Evans (1965). Measurements were made from slide-mounted material and expressed in micrometers (μm). The types are deposited in the Zoological Museum of the Jagiellonian University, Cracow, Poland (ZMJU), in the MHNG and in the EIAZ.

FIG. 1

Holoparasitus apenninorum (Berlese, 1906). Male: A - chelicera, paraxial view; B - idem, antiaxial; C - pedipalp, trochanter and femur; D - corniculus; E - leg II, femur, genu and tibia. *H. cultriger* (Berlese, 1906). Male: F - corniculus; G - chelicera, paraxial; H - sternogenital region and genital lamina; I - leg II, femur, genu and tibia; J - tectum (after Berlese, 1906).



SYSTEMATIC ACCOUNT

REVISION OF *HOLOPARASITUS APENNINORUM* (BERLESE, 1906) AND *H. CULTRIGER* (BERLESE, 1906)

The material of *H. apenninorum* (Berlese, 1906) in the Berlese collection named *Ologamasus pollicipatus* var. *apenninorum* consists of 28 specimens on 10 slides and is in fact a mixture of four species, i.e.:

1. *H. apenninorum* (Berlese, 1906). 1 ♂ non-dissected (slide 5/19), Vallombrosa (Toscana, Italy), from moss; lectotype by present designation.

2. *H. crassisetosus* sp. n., 1 ♀ dissected (6/40), 4 ♀ ♀ (6/41), 6 ♂ ♂, 1 ♀, 2 deutonymphs (7/35), 2 ♂ ♂, 2 ♀ ♀ (7/37), Vallombrosa.

3. *H. digitiformis* sp. n., 1 ♀ (6/42), 1 ♂ (6/43), 1 ♀ (6/44), Monte Senario (Toscana).

4. *H. cornutus* sp. n., 1 ♂, 1 ♀ (7/39), Bevagna (Umbria, Italy); 1 ♂, 3 ♀ ♀ (7/40), Monte alle Forche (Toscana).

Berlese also recognized in his material from Vallombrosa another variety, *Ologamasus pollicipatus* var. *cultriger*. This is a valid species, *Holoparasitus cultriger* (Berlese, 1906), though only one specimen is known, a dissected male which is on slide 5/19 together with the lectotype of *H. apenninorum* noted above. Some specimens of *Paragamasus decipiens* (Berlese, 1903) and of *Holoparasitus* mentioned above are mounted together: 1 ♀ on slide 6/44, 1 ♀ on slide 7/39 and 1 ♂, 1 ♀ on slide 7/40.

***H. apenninorum* (Berlese, 1906)**

Fig. 1 A-E

Gamasus (*Ologamasus*) *pollicipatus* var. *apenninorum* Berlese, 1906: 253 (in part).

Holoparasitus lichenis var. *apenninorum* (Berlese, 1887) sensu Turk 1953, Micherdziński 1969: 372.

not *Holoparasitus apenninorum* (Berlese, 1906) sensu Juvara-Bals 1975, Acarologia, p: 400.

Type material: lectotype 1 ♂ non-dissected, slide 5/19, from moss, Vallombrosa (Toscana) in Berlese Acaroteca, ELAZ; by present designation.

Our description is based on a non-dissected single male in lateral position so that only some of the main characters could be observed.

Diagnosis. Male: excipulum absent; cheliceral movable digit with a single tooth, fixed digit enlarged along its distal third, with 6-7 denticles; leg II with the femoral apophysis straight and thumb-like (Fig. 1E).

Description. Male. The legs I-IV were attached only on the right side of the animal. The others were lost but leg II could be seen in the mounting medium detached from the animal. Gnathosoma. Movable digit of chelicera with a single tooth situated medially. Fixed digit, enlarged along its upper third, with 6-7 denticles. Spermatotreme in the form of a fine slit, arthrodial process setiform antiaxially and brush-like paraxially (Fig. 1 A,B). Pedipalp: trochanter simple, femur with slight ventral protuberance located distally (Fig. 1 C). Corniculi triangular, with small protuberance on ventral side (Fig. 1 D).

Leg II. Main features of leg II shown in figure 1 E. Femoral apophysis straight and thumb-like, axillary process elongated and smooth. Spur on genu and tibia conical, located midway on ventral face. Measurements: tarsus I = 104 μ m; tarsus IV = 122 μ m.

Discussion. Berlese's (1906) original description of *H. apeminiorum* was based on a male and several females, from a moss sample taken at Vallombrosa. Berlese described in detail only the male's chelicera but presented figures of three different chelicerae as well as of the epistome, and of the male's leg II. The drawing of the chelicera shown in the fig. 15a, tab. XIII. (σ from Vallombrosa) corresponds to the original description which specified that "digitus mobilis basi latiusculus, externe gibbosus, dente magno, unico..."; the characteristics of this type of chelicera can be seen only on the non-dissected male of the slide 5/19. Berlese attributed to *H. apeminiorum* two other chelicerae (Fig. 15, Fig. 16, tav. XIII) which have two teeth on the inner margin of the digitus mobilis. He also mentioned a figure 16a which in fact does not exist. Micherdziński (1969) paid also attention to the similarity between Berlese's initial description and only one of the chelicerae illustrated. Berlese's figure of the male's leg II corresponds either to the leg of *H. digitiformis* or to that of *H. crassisetosus*, two species found in the same area as *H. apeminiorum*. The triangular epistome figured by Berlese can not be seen any more because of the lateral position of the animal.

The characteristics of the female endogynium was neither described nor drawn in detail; figure 7, tab. XIX refers either to *H. digitiformis* or to *H. crassisetosus* which have very similar females. Berlese's material also contained *H. crassisetosus* from Vallombrosa and *H. digitiformis* from Monte Senario. Unfortunately, we did not find another male of *H. apeminiorum* or a corresponding female. However, it is obvious that the male mounted on slide 5/19 is a syntype. We designate it as the lectotype of *H. apeminiorum* (Berlese, 1906).

Specimens identified by Juvara-Bals (1975) as *H. apeminiorum* belongs in fact to *H. corvutus* sp. n. The species was misidentified because at that time it was not recognized that original description of Berlese related to a mixture of species.

H. cultriger (Berlese, 1906)

Fig. 1 F-J

Type material: 1 σ holotype, dissected (slide 5/19), Vallombrosa (Toscana, Italy), from moss, Berlese Acaroteca (EIAZ).

Diagnosis. Male: excipulum present; cheliceral movable digit with two little denticles, fixed digit markedly longer than movable one, blade-like and toothless; leg II with tibia bearing two processes: dorsally one rounded located near proximal margin and ventally an elongated situated near distal margin (Fig. 1 I).

Description. Male. The length of the idiosoma could not be measured because the single specimen is in pieces. The few characteristics observed are shown in figure 1. Sternogenital region reticulated, with slightly sclerotized excipulum; anterior margin of genital lamina with several small denticles in the middle (Fig. 1 H).

Gnathosoma. Tectum trispinate, central prong well developed (Fig. 1 J). Corniculi triangular, each with ventral protuberance (Fig. 1 F). Chelicera as in figure 1 G:

fixed digit blade-like and toothless, markedly longer than movable one; movable digit with two little denticles subapically.

Legs. Armature of legs II as in figure 1 I. Femoral apophysis strong, thumb-like and curved; axillary process short and rounded. Genual process large, plump or rounded, situated in distal half on ventral face. Tibia with two protuberances: regular process elongated and located ventrally close to distal margin of segment, an extra process larger, located dorsally on proximal third of segment. Ventral face of trochanter IV with protuberance. Measurements: tarsus I = 138 μm , tarsus IV = 150 μm .

Discussion. Berlese described this species on the basis of a single male in poor condition. The type specimen is together with that of *H. apenninorum* on the same slide. The two types may be easily distinguished: *H. apenninorum* is in lateral view and non-dissected while *H. cultriger* is in several pieces. The most valuable character separating *H. cultriger* from the other species with an excipulum is the special blade-shaped fixed digit of the chelicera.

Holoparasitus crassisetosus sp. n.

Figs. 2,3

Type material: 1 ♂ holotype, 48 ♂♂, 66 ♀♀ paratypes, Vallombrosa (Toscana, Italy) (alt. 960 m), coniferous forest (*Abies alba*), 6.11.1982. Collected by the staff of DEBS. The holotype as well as 4 ♂♂ and 5 ♀♀ paratypes have been deposited in MHNG, 44 ♂♂ and 61 ♀♀ have been deposited in ZMJU.

Other material examined: Berlese Acaroteca (EIAZ), 1 ♀ (slide 6/40), 4 ♀♀ (6/41), 2 ♂♂, 2 ♀♀ (7/37), 5 ♂♂, 2 ♀♀, 2 deutonymphs (7/35). All this material was collected in Vallombrosa, but the habitat was not specified.

Diagnosis. The species is recognisable by very thick seta pv1 on tibia IV in both sexes (Fig. 2 A,B).

Description. Male. Idiosoma brown, well sclerotized. Dimensions of idiosoma: 555-585 x 365-380 μm ; L/W (length/width) factor 1.46-1.56, N=10. Podonotal region with 20 pairs of setae, j1 = 38-40 μm , other 19-22 μm ; opisthonotal region with 30 pairs of shorter setae, 10-13 μm .

Ventral side (Fig. 2 C). Genital lamina large, located in a well sclerotized concavity, its lateral sides forming triangular sharp projections, its anterior edge with median pleated membrane and two lobes; postero-lateral edges of genital lamina with two well sclerotized protrusions.

Male genital orifice, flanked by triangular presternal shields and provided with large rectangular microsclerite bearing tritosternum. Reticulation of sternogenital region regular: between anterior margin and close to sternal setae 1 (st1), sternal shield more heavily sclerotized and its reticulation slightly convex; length of sternal setae about 42 μm . Opisthogastric region with 8 pairs of setae (26-39 μm).

Gnathosoma. Tectum trispinate, with long, broad central prong (Fig. 3 I). Corniculi with paraxial margin forming rounded lamellar protrusion (Fig. 2 D,E). Hypognathal groove with 11 complete rows of denticles; palpcoxal setae pilose, hypostomatic setae simple (Fig. 2 D). Chelicera (Fig. 2 F,G). Both digits short and robust. Fixed digit toothless, with pilus dentilis flanked by two convex laminae. Movable digit with two teeth. Arthrodial membrane at the base of movable digit with well developed

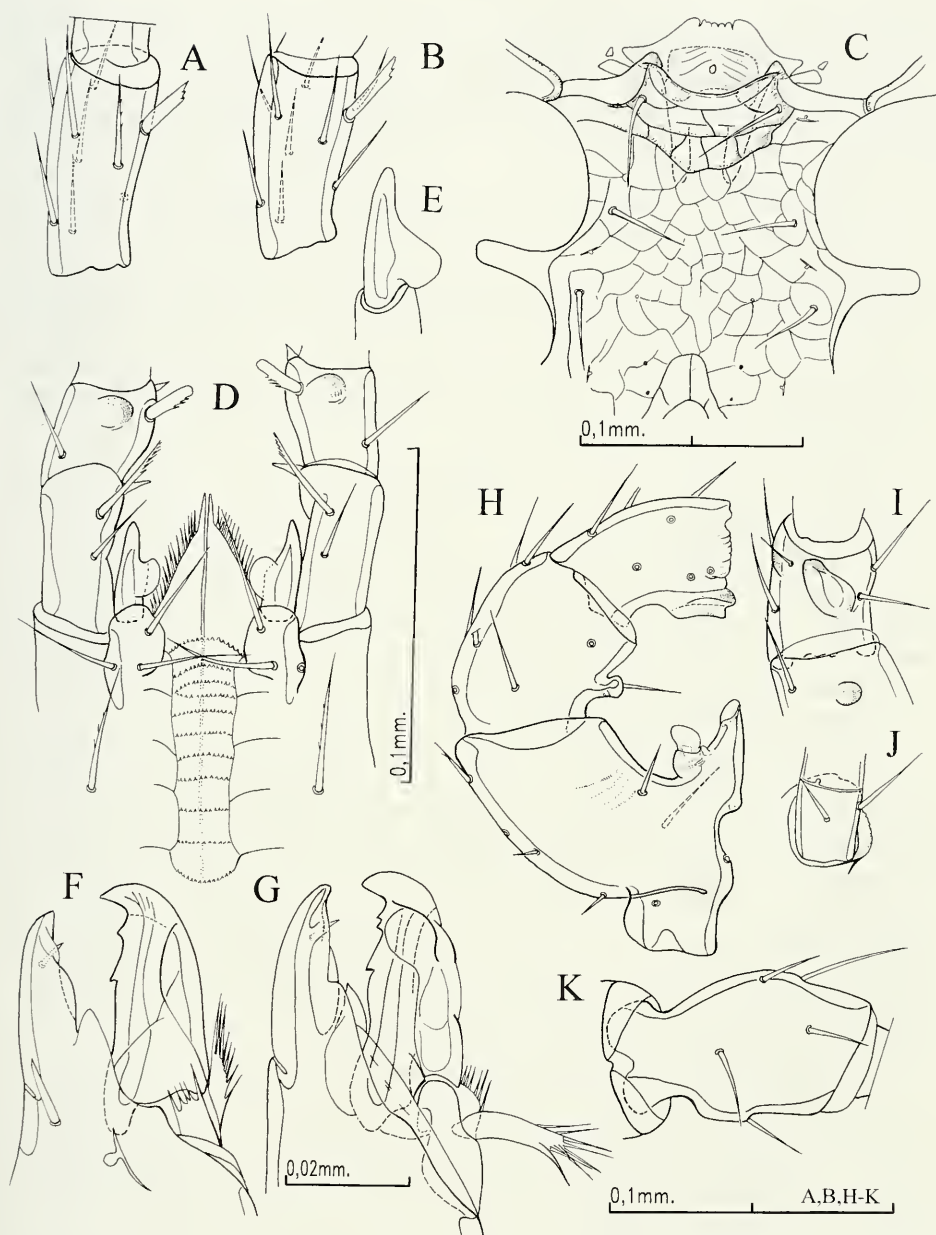


FIG. 2

Holoparasitus crassisetosus sp. n. Male: A-tibia IV; C-sternogenital region and genital lamina; D-gnathosoma, palptrochanter and palpfemur; ventral; E-corniculus; F-chelicera, antiaxial; G-idem, paraxial; H-leg II, femur, genu and tibia, antiaxial; I-tibia, ventral; J-basis tarsus and cuticular edge of tibia; Female: B-tibia IV.

brush-like process on paraxial side and a lesser developed one on antiaxial side, synarthrodial membrane short and wedge-shaped.

Pedipalps. Trochanter with proximal seta (v1) simple and distal seta (v2) pilose. Femur with tubercle located on ventral side close to anterolateral seta. Anterolateral seta of femur spatulate and pectinate on inner side (Fig. 2 D); anterolateral setae of genu spatulate.

Legs. Coxae II with ridge of 5 denticles (Fig. 3 J). Leg II armed as shown in figure 2 H-I. Femoral apophysis finger-shaped and straight, axillary process curved towards the femur. Spur on genu small, round, located ventrally in the middle. Apophysis on tibia low and long, with slightly convex margin, attached ventrally and reaching with its rounded distal end the margin of segment; the cuticle of anterodistal edge of tibia with several fine furrows. Trochanter IV with flattened protuberance situated medioposteriorly (Fig. 2 K). On tibia IV seta pv1 conspicuous, very thick with a dentate end (Fig. 2 A). Measurements: tarsus I = 139-144 μm ; tarsus IV = 146 μm .

Female. Idiosoma brown, well sclerotized. Dimensions of idiosoma: 630-665 x 445-475 μm (L/W factor 1.36-1.45, N=10). Podonotal setae: j1 = 39 μm , other setae 19-26 μm ; opisthonotal setae 12-18 μm .

Ventral side (Fig. 3 A). Fused presternal shields forming smooth ribbon, partially connected to lateral platelets. Anterior margin of sternal plate sometimes with incisions of a soft cuticle, laterally to setae st1. Reticulation of sternal shield with two prominent lines delimiting a slightly more sclerotized anterior region of sternum: one line V-shaped extending medially and second line running close to second pair of pores (pst2). Margin of exopodal plate facing coxa I sclerotized.

Genital region. Epigynial plate heptagonal, anterior margin with a middle triangular apex and two lateral spines curved antiaxially; subapical structure small and oval, with lateral rounded protrusions extending beyond epigynial margin (Fig. 3 C). Paragynia rectangular with elliptical thickenings in front of coxae IV and not extending beyond paragynium edge, paragynial posterior protrusions elongated (Fig. 3 B). Endogynium oval, 22 x 29 to 24 x 31 μm . Distance between endogynial margin and coxa IV nearly two times larger than endogynium length (56-59 μm). Shape of endogynium cup-like, with anterior margin protruding into dorsally directed appendage, which looks like hollow tube (Fig. 3 D). Gland pores behind coxa IV large. Opisthogastric region with 8 pairs of setae, their length 36-39 μm .

Gnathosoma. Tectum trispinate, central prong long and narrow, lateral prongs small; minute additional spines discernible between central and lateral prongs (Fig. 3 E). Corniculi conical. Hypognathal groove with 6-8 rows of denticles ending at palpcoxal setae level; some lateral lines present, starting from hypognathal groove; cuticular ridges between palpcoxal setae serrated (Fig. 3 F). Palpcoxal setae slightly pilose, hypostomatic setae simple.

Chelicera. Fixed digit with two teeth in front of pilus dentilis, a third, smaller tooth frequently present between them; two teeth and a lamella with slightly concave edge located behind pilus dentilis. Movable digit with three teeth (Fig. 3 G).

Pedipalps. Proximal seta of trochanter (v1) simple, distal seta (v2) pilose (Fig. 3 F), anterolateral seta of femur spatulate and pectinate on one side, and anterolateral setae of genu spatulate. Femur with poorly visible tubercle located anterolaterally.

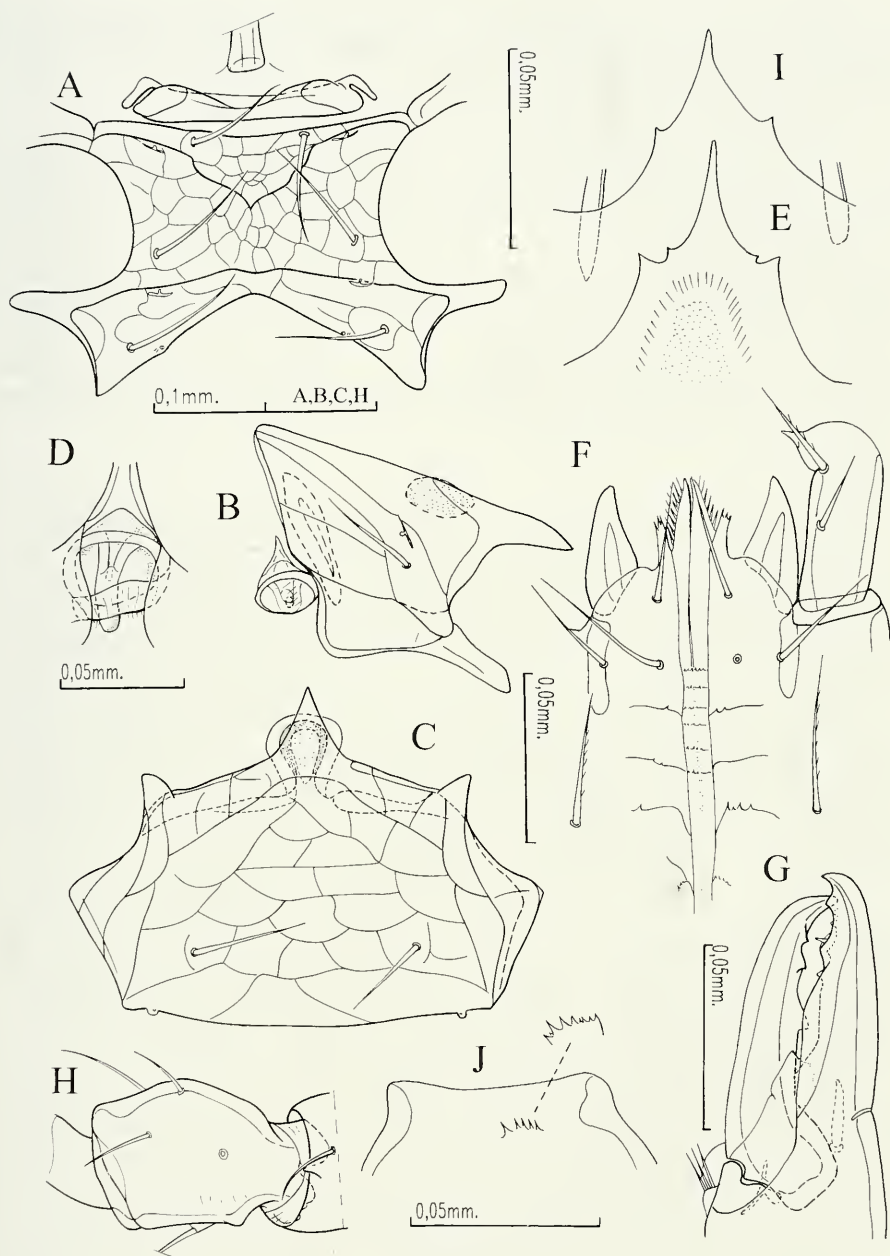


FIG. 3

Holoparasitus crassisetosus sp. n. Female: A-presternal and sternal shields; B-paragynium; C-epigynum; D-endogynium; E-tectum; F-gnathosoma and palptrochanter, ventral; G-chelicera, paraxial; H-trochanter IV, ventral. Male: I-tectum; J-coxa II, denticulated ridge.

Legs. Coxa II with a ridge of about 5 denticles on anterior face. Tibia IV with very thick pv1 seta, its end dentate (Fig. 2 B). Trochanter IV with rounded protuberance located on proximal third of posterior face (Fig. 3 H).

Measurements: tarsus I = 144-154 μm ; tarsus IV = 156-163 μm .

Discussion. Males and females of *H. crassisetosus* are very similar to those of *H. digitiformis*. From other *Holoparasitus* species known to date these species differ in the following features. In males, excipulum is absent, tectum trispinate, movable and fixed digits of chelicera with 2 and 0 teeth, respectively. Corniculi possess a lamellar dilatation or indentation on the paraxial margin. In females, presternal plates and lateral platelets accreted, the endogynium soup-spoon-shaped. The most easily recognized feature which distinguishes *H. crassisetosus* and *H. digitiformis* is the presence of the transformed pv1 seta of tibia IV in both sexes of the former species. A detailed discussion of the most important differences between the two species is given at the end of the description of *H. digitiformis*.

Holoparasitus digitiformis sp. n.

Figs 4, 5

Type material: 1 ♂ holotype, 52 ♂♂, 39 ♀♀ paratypes, from litter of oak forest (*Quercus cerris*, *Q. pubescens*) and 68 ♂♂ and 72 ♀♀ paratypes, from litter of pine forest (*Pinus nigra*, *Erica arborea*, *Juniperus communis*). The two forests are situated at Selvapiano (Commune di Rufina, Toscana), 25 km away from Florence at an altitude of 200 m. The two habitats are about 300 m apart and are situated on the same side of the mountain, facing south-west. The material was collected from February 1971 to April 1974 by Dr. R. Nannelli and Dr. F. Pegazzano (EIAZ).

Other material examined: 19 ♂♂, 15 ♀♀, Catena del Marghine (Marghine Range), Sardinia, from moss and lichens in yew (*Taxus baccata*) and oak forests along the road to Bolotana, alt. ca 1000 m, 30.03.1977, collected by the staff of the DEBS and deposited in ZMJU.

1 ♀ (slide 6/42), 1 ♂ (6/43), 1 ♀ (6/44), Monte Senario, Toscana, Berlese Acaroteca (EIAZ). The material has been deposited as follows: 1 ♂ holotype, 32 ♂♂, 19 ♀♀ paratypes from oak forest and 48 ♂♂, 52 ♀♀ paratypes from pine forest – in MHNG; 20 ♂♂, 20 ♀♀ paratypes from both habitats – in ZMJU; 20 ♂♂, 20 ♀♀ paratypes from both habitats – in EIAZ.

Diagnosis. In both sexes all setae on tibia IV of normal appearance. Male: excipulum absent; movable digit of chelicera with two denticles, fixed digit edentate, slender, finger-like, with slightly dilated apex. Female: epigynum with subapical small ovoid microsclerite and hyaline wing-like protrusions extending anterolaterally (Fig. 5 D). Endogynium small, oval, inverted cup-like, with anterior margin protruding into a cuticular solid appendage directed more or less dorsally (Fig. 5 B,C,E).

Description. Male. Idiosoma well sclerotized. Dimensions of idiosoma: specimens from Selvapiano, Toscana, oak forest: length 576-617 μm ; idem, specimens from pine wood, length 634-641 μm . Specimens from Sardinia, idiosoma size 585-635 x 405-430 μm (L/W factor 1.45-1.57, N=10). Podonotal region with 21 pairs of seta, j1=39 μm , the others 26-28 μm opisthonotal region with about 30 pairs, 19-24 μm .

Ventral side. Genital lamina large, situated in well defined concavity of heavily sclerotized anterior margin of sternal shield; anterior margin of the lamina with two fine lobes separated by a concavity and two lateral triangular prongs. Between lateral prongs and anterior lobes, on their inner face, two well sclerotized prominences. Behind genital lamina a rectangular microsclerite with a rounded lobe ventrally supporting the base of

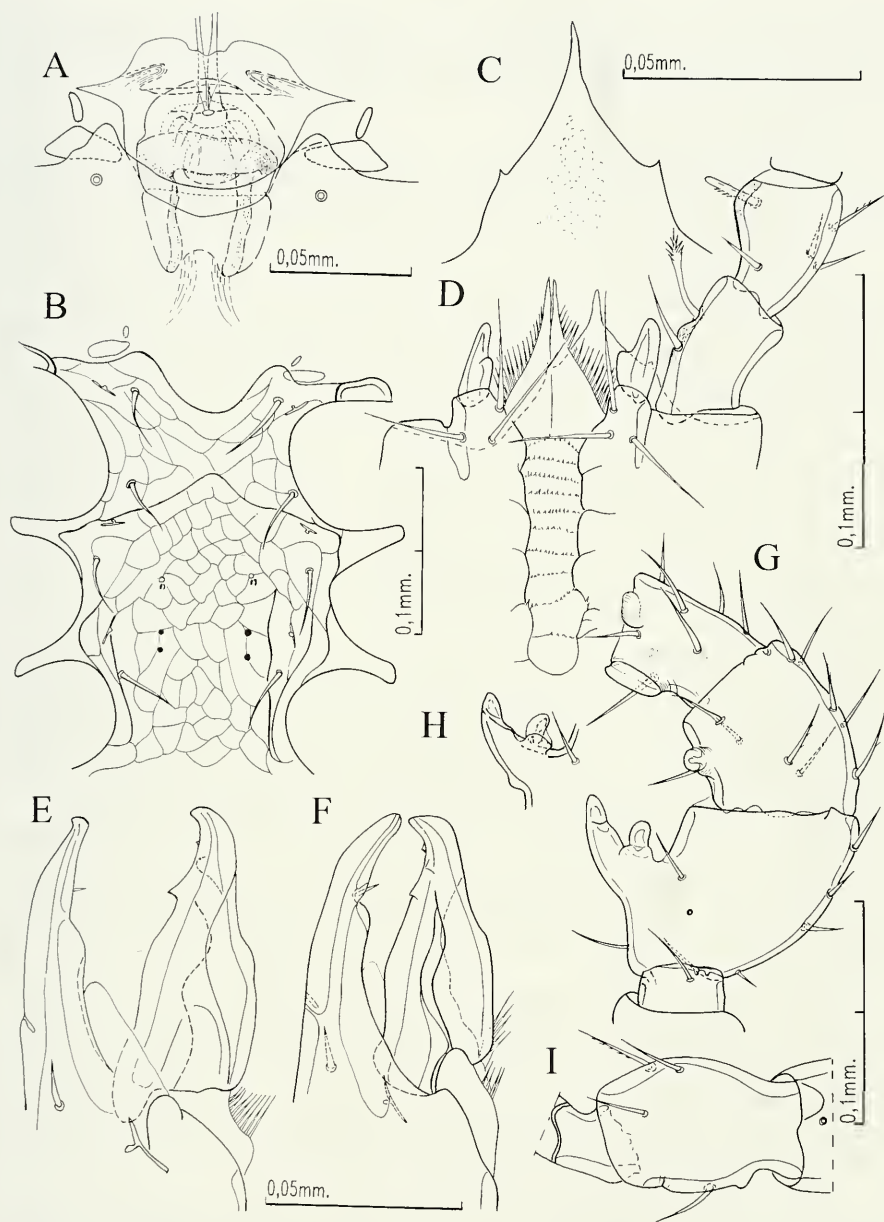


FIG. 4

Holoparasitus digitiformis sp. n. Male: A-genital lamina; B-sternogenital shield; C-tectum; D-gnathosoma and palptrochanter, palpfemur, ventral; E-chelicera; F-idem, paraxial; G-leg II, femur, genu and tibia, paraxial; H-femoral apophysis, antiaxial; I-trochanter IV, ventral.

tritosternum (Fig. 4 A). Sternogenital shield with scale-like reticulation and with marked line (inverted V) behind second pair of sternal setae; length of sternal setae 39-46 μm (Fig. 4 B). Large gland pore behind coxae IV. On opisthogaster 8 pairs of setae, 24-36 μm .

Gnathosoma. Tectum trispinate, lateral prongs small, the central one large, broad at the base and pointed (Fig. 4 C). Corniculi with small prominence situated paraxially; hypognathal groove with 10-11 rows of denticles; palpcoxal setae finely pilose, hypostomatic setae simple (Fig. 4 D).

Chelicera (Fig. 4 E,F). Fixed digit edentate, slender, finger-like; its apex slightly dilated and sometimes curved. Movable digit with two denticles, the distal one sometimes appearing much more paraxially, synarthrodial membrane rounded. Spermatodactyl large, with a median concavity; arthrodial membrane with short brushy process paraxially and setiform margin antiaxially.

Pedipalps. Palptrochanter with seta v1 thin and simple, whereas v2 thicker and pilose. Palpfemur with anterolateral seta pectinate on one edge; palpgenual anterolateral setae simply spatulate. Palpfemoral segment swollen distally, with tubercle located on ventral side, close to al seta (Fig. 4 D).

Legs. Coxa I with a ridge bearing 6-7 denticles, situated paraxially close to distal margin. Coxa II with ridge of 8-10 denticles (Fig. 5 J). Armature of leg II illustrated in figure 4 G.

Femoral apophysis relatively long, finger-shaped, with curved apex and a small tubercle on its base (Fig. 4 H); axillary process curved. Genu with small rounded spur situated medioventrally. Tibia with two spurs: one low and elongated, reaching distal margin, another smaller, located anterolaterally and extending beyond segment margin. Posterior face of trochanter IV with a small tubercle under seta pv (Fig. 4 I).

Measurements: specimens from Toscana: tarsus I = 156-158 μm ; tarsus IV = 168-173 μm .

Female. Idiosoma well sclerotized, brown coloured. Dimensions of idiosoma: 660-710 x 490-530 μm (L/W factor 1.28-1.42, N=10). Podonotal region with 21 pairs of setae, j1=36 μm , the others 16-20 μm ; opisthonotal region with 33 pairs of short setae (13-16 μm).

Ventral side. Accreted presternal shields forming a smooth ribbon-shaped plate, more narrow medially; lateral presternal platelets usually free. Anterior margin of sternal plate with two less sclerotized concavities, frequently flanking bases of setae st1; reticulation of sternum easily discernible with prominent arched transverse line passing close to pores pst2 (Fig. 5 A); length of sternal setae from 46 μm (st1) to 65 μm (st3). Anterior edge of exopodal shield facing leg I thickened.

Genital region. Paragynial shield with sclerotized elliptical thickening in front of coxa IV (Fig. 5 B,C). Postero-lateral protrusions long and narrow, ending with rounded or sometimes pointed edge. Metagynial sclerites with paraxial margins convex. Epigynial shield with anterior margin formed by a triangular central apex and two large lateral prongs curved antiaxially; subapical epigynial structure with small ovoid microsclerite and hyaline wing-like protrusions extending anterolaterally (Fig. 5 D). Endogynium (Fig. 5 B,C,E) small, oval (20 x 27 μm to 27 x 33 μm), inverted cup-like,

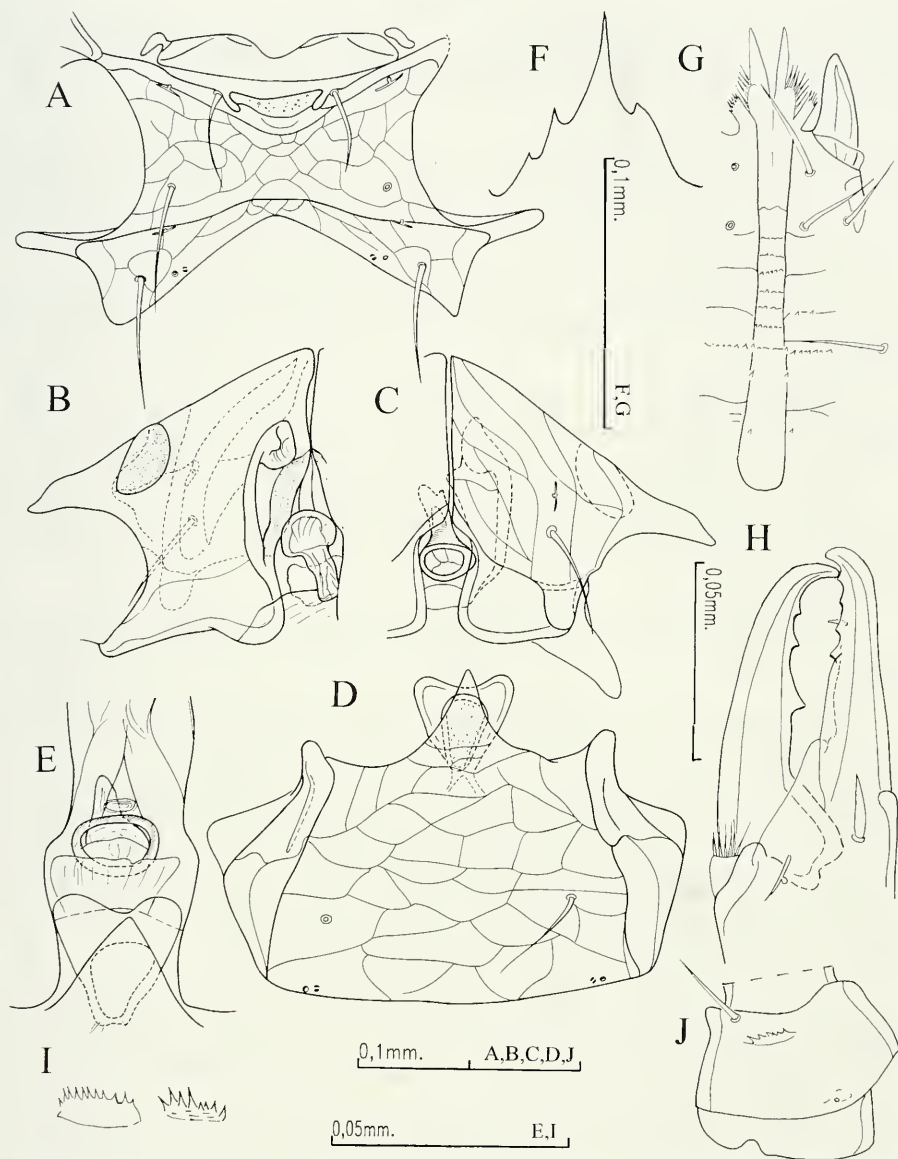


FIG. 5

Holoparasitus digitiformis sp. n. Female.: A-presternal and sternal shields; B-paragnathia and endogynium, dorsal; C-idem, ventral; D-epigynum; E-endogynium; F-tectum; G-hypognathal groove and corniculus; H-chelicera, antiaxial; I-coxa II, denticulated ridge. Male: J-coxa II, paraxial.

with anterior margin protruding into a cuticular solid appendage directed more or less dorsally; poorly visible scale-like fine hyaline flap covering endogynium on ventral side. Gland pores behind coxa IV large. Opisthogastric region with 8 pairs of setae, their length about 39 μm .

Gnathosoma. Tectum usually trispinate, with central prong sharply pointed, sometimes an extra spine present on one side (Fig. 5 F). Corniculi conical. Hypognathal groove with 8-11 rows of denticles, those located posterior to the level of palpcoxal setae frequently reduced or absent, some lateral lines present between hypostomatics and palpcoxal setae (Fig. 5 G). Palpcoxal setae pilose, hypostomatics simple.

Chelicera. Fixed digit with two teeth in front of pilus dentilis, two more teeth and a thin, concave cuticular edge behind pilus dentilis. Movable digit with three teeth (Fig. 5 H).

Pedipalps. Trochanter ventral setae finely pilose; anterolateral seta of femur spatulate and pectinate on one edge; anterolateral setae of genu simply spatulate. Palp-femur swollen distally, with tubercle located on ventral side close to anterolateral seta.

Legs. Leg structure and setation unremarkable. Coxa I with row of about 10 little denticles on distal paraxial margin. Coxa II with ridge of 8 to 10 fine denticles situated on anterior face (Fig. 5 I). Measurements: tarsus I = 154-163 μm ; tarsus IV = 168-175 μm .

Discussion. *H. digitiformis* is similar to *H. crassisetosus* in respect to the general structure of the genital region in the female and to the shape of the armature of leg II in the male.

The endogynium in both species is small and inverted cup-shaped, with the anterior margin forming a cuticular protrusion directed dorsally, thus similar in appearance to a soup-spoon. In *H. crassisetosus*, this protrusion is relatively shorter (as compared with the size of endogynium) than in *H. digitiformis* and appears as a hollow tube. The metagynial sclerites are oriented roughly parallel in both species, but in *H. digitiformis* their lateral margins are convex, whereas in *H. crassisetosus* they are rather concave. The subapical epigynial structure has prominent wing-like protrusions in *H. digitiformis* but only small round protrusions in *H. crassisetosus*.

Males in both species have a very similar armature of leg II, especially on the femur and genu; on the tibia, however, in *H. digitiformis* the additional prominent anterolateral tubercle is present, whereas in *H. crassisetosus* the cuticle of corresponding place shows fine furrows only. A very pronounced difference can be seen in the shape of the male corniculi: *H. digitiformis* has a small protuberance on the paraxial margin, whereas in *H. crassisetosus* this margin extends prominently forming a thin rounded lamella.

In both sexes, the most important character for differentiation of these two species remains the form of seta pv1 of tibia IV: it is narrow and simple in *H. digitiformis* but thick and notched at the end in *H. crassisetosus*. *H. digitiformis* was found in the surroundings of Florence (Toscana) in coniferous forest as well as in Sardinia where it occurs in soil of yew and oak forests. *H. crassisetosus* was collected, till now, only from Vallombrosa (Toscana), where it lives in coniferous forests.

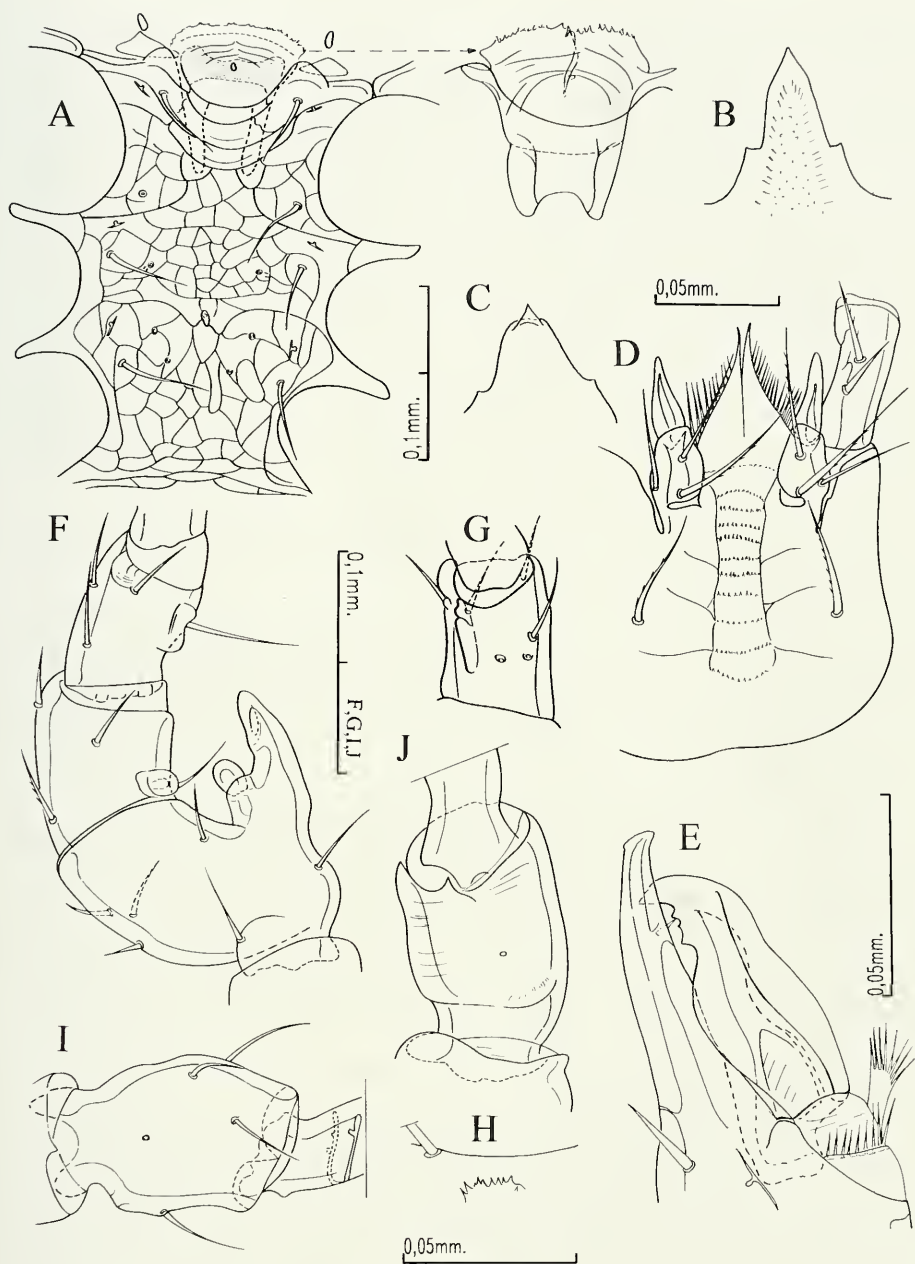


FIG. 6

Holoparasitus cornutus sp.n. Male: A-scutum sternogenital and genital lamina; B-tectum; C-tectum (Bevagna-Umbria, Berlese Acarotoca); D-gnathosoma and palptrochanter, ventral; E-chelicera, antiaxial; F-leg II, femur, genu and tibia; G-tibia II, ventral (Bevagna-Umbria, Berlese Acarotoca); H-coxa II, denticulate ridge; I-trochanter IV, ventral; J-idem, dorsal.

Holoparasitus cornutus sp. n.

Figs. 6, 7

H. apenninorum sensu Juvara-Bals 1975: 400; nec Berlese, 1906.

Type material: 1♂ holotype, 2♂♂, 4♀♀ paratypes, Vallombrosa (Toscana, Italy), litter in beach forest, 19.09.1971: 14♂♂, 11♀♀ paratypes, Vallombrosa, moss in coniferous forest (*Abies alba*), alt. 960 m, 6.11.1982. All paratypes collected by the staff of DEBS. The holotype and 1♂, 2♀♀, 2 deutonymphs have been deposited in MHNG, whereas 16♂♂, 13♀♀ in ZMJU.

Other material examined. Italy: 1♂, 1♀, Monte Amiata near Siena, Toscana, litter in beach forest, alt. ca. 900 m: 4♀♀, Monte Amiata, litter in chestnut forest, alt. ca. 800 m, 17.09.1990, leg. W. Witaliński, deposited in ZMJU. 1♂, 3♀♀ (slide 7/40), Monte alle Forche, Toscana, and 1♂, 1♀ (slide 7/39), Bevagna, Umbria, Berlese Acaroteca (EIAZ).

Romania: 1♂, 1♀, Cerbului Valley, Busteni, Bucegi Mountain, Meridional Carpathians, sawdust and litter, beech and spruce forest, 5.6.1967, leg. I. Juvara-Bals, deposited in MHNG.

Diagnosis. The species can be recognized by a lamellar process ending with one or two spurs, situated more or less dorsally at the distal margin of trochanter IV in both sexes. Male: excipulum absent; two incisions in sclerotized cuticle behind each group of hypostomatic setae; folded cuticle at the level of legs IV. Female: endogynial sack rounded, with two large, connected teeth on each side.

Description. Male. Idiosoma well sclerotized, its dimensions (Italy) 672-715 x 452-510 µm (L/W factor 1.42-1.48, N=5). Podonotal setae: j1=38 µm, other setae 20-26 µm; opisthonotal setae shorter, 13-19 µm.

Ventral side (Fig. 6 A). Genital lamina with serrated anterior margin. Sternal shield reticulated with a slight median prominence distally; two ridges run from this prominence posteriorly to sternal setae st2 towards the margin of the shield. At the level of coxa IV, cuticle folded in a strongly sclerotized line. Length of sternal setae from 48 µm (st1) to 40 µm (st3). On opisthogastric region 8 pairs of setae, their length from 42 µm (Jv1) to 26 µm (Jv5).

Gnathosoma. Tectum trispinate with central prong triangular, long, and in the specimen from Bevagna, with a little denticle on its tip; lateral prongs tiny (Fig. 6 B,C). Hypognathal groove provided with 11 well dentated rows; gnathosomal setae pilose, except simple hypostomatic seta 3. Behind hypostomatic setae there are incisions in sclerotized cuticle (Fig. 6 D). Corniculi conical. Chelicera (Fig. 6 E). Fixed digit edentate and with truncate apex; movable digit with 2-4 small subapical teeth. Arthrodial membrane formed by a short brush-like processes paraxially and a setiform fringe antiaxially.

Pedipalps. Palptrochanter with seta v1 simple and v2 pilose; palpfemur with distal protuberance on its ventral face.

Legs. Coxa II with ridge bearing 9 denticles located on anterior face (Fig. 6 H). Armature of leg II shown in figure 6 F. Main femoral apophysis long, finger-like, its axillary spur rounded. Spur on genu rounded. Tibia with median saddle-like spur and little distal protuberance situated anterolaterally (Fig. 6 F,G). Dorsal or posterodorsal face of trochanter IV with distal lamellar process ending with one or two spurs; proximal posterolateral face with a protuberance (Fig. 6 I,J). Gland pores behind coxae IV located in a normal cuticle. Measurements: tarsus I = 143 µm (specimen from Romania) and 173-177 µm (specimens from Italy); tarsus IV = 173 µm (Romania) and 184-193 µm (Italy).

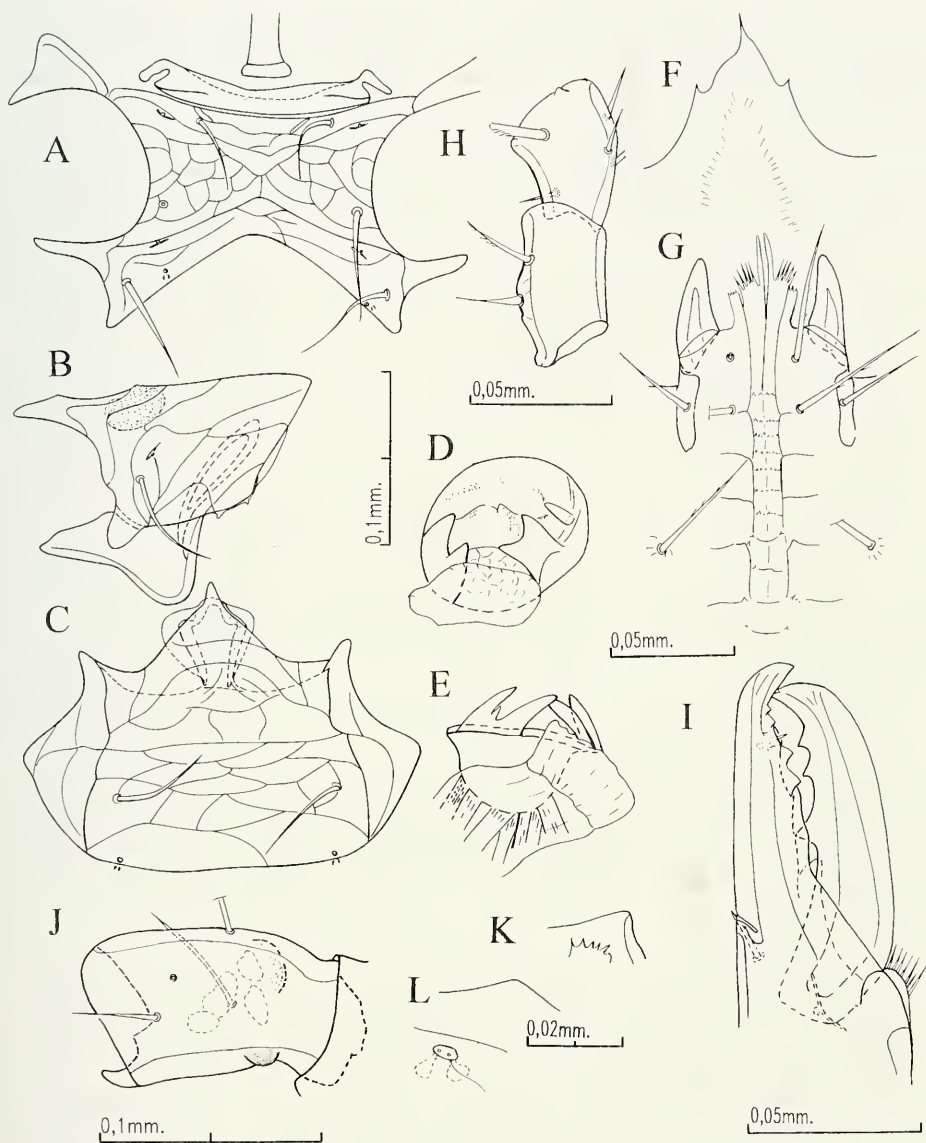


FIG.7

Holoparasitus cornutus sp. n. Female: A-presternal and sternal shields; B-paragynium; C-epigynum; D-endogynium (♀ from Rumania); E-idem. (♀ from Italy); F-tectum; G-hypognathal groove and corniculi; H-palptrochanter and palpfemur, antiaxial; I-chelicera, paraxial; J-trochanter IV, ventral; K-coxa II, denticulate ridge; L-gland gv2.

Female. Dimensions of idiosoma: 580 x 430 μm (L/W factor 1.35), specimen from Romania; 742-806 x 550-580 μm (L/W factor 1.34-1.41, N=5), specimens from Italy. Podonotal setae from 13 μm to 39 μm , j1 = 36-38 μm ; opisthonotal setae shorter, about 13 μm .

Ventral side. Presternal shield smooth, ribbon-like, with two lateral excrescences, sternal shield with transverse ridge at level of pst2, some specimens with two lightly sclerotized indentations in front of setae st1 (Fig. 7 A). Sternal setae slender, 55-60 μm . Paragynial shield provided on its dorsal face with an elliptical thickening in front of coxa IV and on its inner ventral margin with one or two denticles; metagynial sclerite elongated, paragynial posterior protrusion elongated and rounded, paragynial lobe trapezoidal (Fig. 7 B). Epigynium heptagonal; its apex transparent, its subapical structure formed by a fine rounded margin and a sclerotized three-lobed thickening (Fig. 7 C). Endogynium: a rounded sack with two large, connected teeth on each side, covered by a scale flap ventrally, sometimes provided with denticles on inner walls; dorsally, its cuticle with many pores arranged in ca. 8 rows of muscle-prints (Fig. 7 D,E.). Gland pores behind each coxa IV located in a normal cuticle (Fig. 7 L). On opisthogaster 8 pairs of setae, their length from 40 μm (Jv1) to 24 μm (Jv5).

Gnathosoma. Tectum trispinate, lateral prongs tiny (Fig. 7 F). Hypognathal groove with 9-10 lines, anterior dentate, posterior bare; external posterior hypostomatic seta simple, other gnathosomal setae slightly pilose. Corniculi conical (Fig. 7 G).

Chelicera. Fixed digit with 3 minute denticles in front of pilus dentilis and behind it two teeth and a cuticular edge (Fig. 7 I).

Pedipalps. Trochanter with seta v1 simple and seta v2 slightly pilose. Femur with small protuberance near al seta (Fig. 7 H).

Legs. Coxa II with ridge bearing about 6 denticles (Fig. 7 K). Trochanter IV provided proximally with rounded protuberance on posterolateral face and with lamellar process, pointed in one or two spurs, dorsally or posterodorsally on distal margin of segment (Fig. 7 J). Measurements: tarsus I = 145 μm (specimen from Romania) and 164-173 μm (specimens from Italy); tarsus IV = 166 μm (Romania) and 189-196 μm (Italy).

Discussion. Juvara-Bals (1975) identified and described under the name of *H. apenninorum* (Berlese) specimens of *Holoparasitus* collected in the surroundings of Siena (Italy) and in Bucegi Mountain, Meridional Carpathians (Romania). She thought that the material belonged to *H. apenninorum* according to characteristics of male chelicera. In fact, Berlese (1906) had drawn two types of chelicera for *O. pollicipatus* var. *apenninorum*, as already discussed in the comments to the redescription of that species. Figure 16, tab. XIII by Berlese (1906) was a drawing of a specimen from Monte Senario which is the same as *H. cornutus*, the new species described above. The specimens of *H. cornutus* from Romania and Italy do not exhibit significant differences (Juvara-Bals, 1975). The male genital lamina is not serrated in specimens from Romania but instead it has only two central denticles. The number of teeth on the movable digit is 2 in Romanian versus 3 in Italian specimens and the shape of the tectum is slightly variable. *H. cornutus* is characterised especially by the lamellar process situated more or less dorsally on margin of trochanter IV in both sexes. Other characteristics

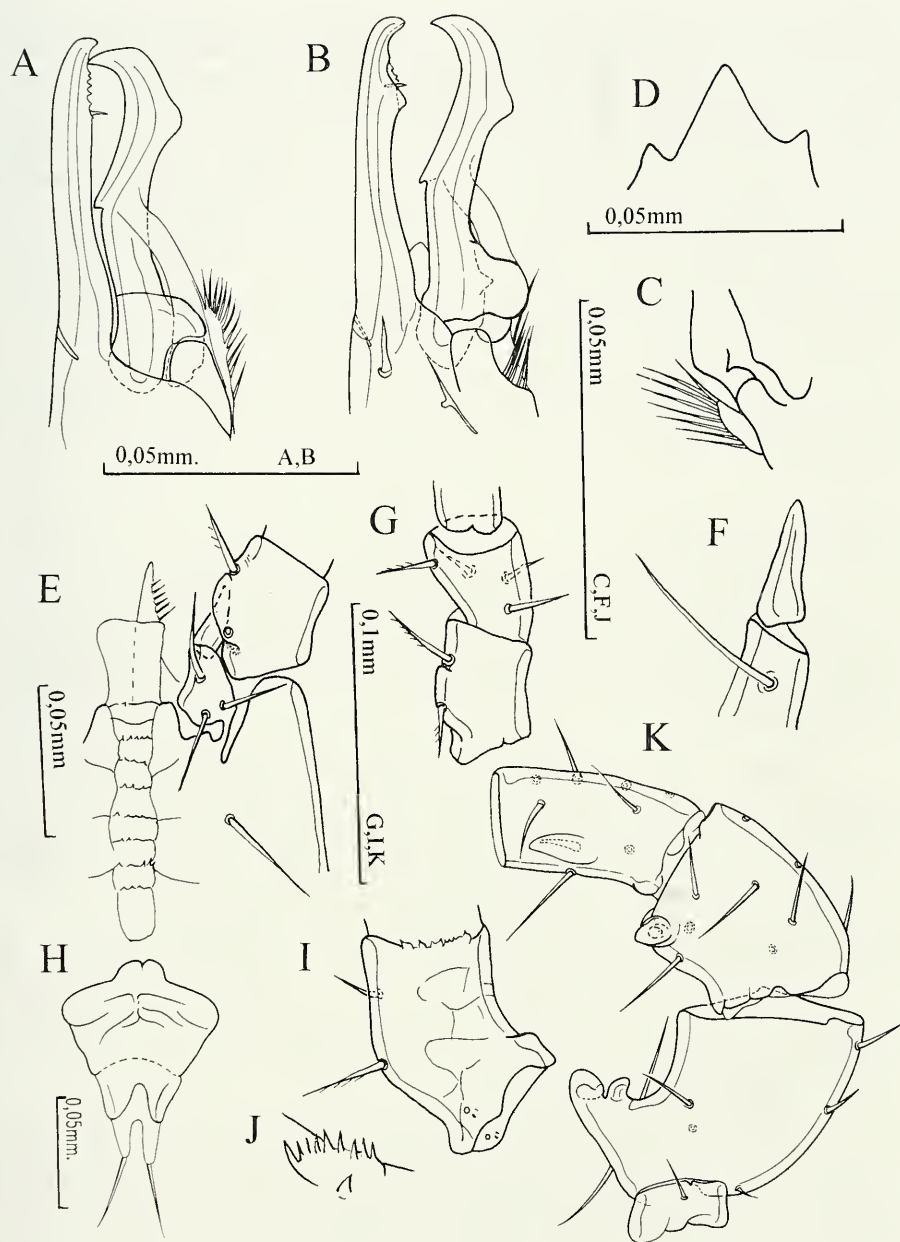


FIG. 8

Holoparasitus gibber sp. n. Male: A-chelicera, paraxial; B-idem, antiaxial; C-base of movable digit; D-tectum; E-gnathosoma and palptrochanter, ventral; F-corniculus; G-palptrochanter and palpfemur; H-genital lamina; I-coxa I, paraxial; J-coxa II, denticulate ridge; K-leg II, femur, genu and tibia.

such as the shape of the chelicera and armature of leg II in the male, as well as the particularities of the endo- and epigynum of the female distinguish this species from the other species belonging to the complex *O. pollicipatus* var. *apenninorum* sensu Berlese 1906. We also have to mention the species *H. hemisphaericus* (Vitzthum, 1923) described on the basis of a single female found in Austria. This species was considered by Juvara-Bals (1975) to be synonymous with *H. apenninorum* sensu Juvara-Bals, 1975. *H. cornutus* was compared with the type of *H. hemisphaericus* kindly sent to the senior author by Dr. L. Tiefenbacher (Munich, Germany). *H. hemisphaericus* is a valid species which differs from *H. cornutus* by the shape and size of the dorsal protuberance located distally on trochanter IV, by the absence of the proximal protuberance on trochanter IV, as well as by the paragynia, characterised by thickenings at paraxial margins but devoid of any thickening in front of coxa IV. Unfortunately, this species is known only on the basis of one female and on the single specimen available the characteristics of the epigynum and those of the endogynium cannot be properly observed.

***Holoparasitus gibber* sp. n.**

Figs 8, 9

The species is described from permanent slides of the Athias-Henriot collection. The length of the idiosoma cannot be measured because the specimens are crushed.

Type material: 1 ♂ holotype, 2 ♂♂, 3 ♀♀, 1 deutonymph, paratypes, Los Palacios (near Seville, Spain), sifting of flood litter, 22.02.1951, leg. H. Franz, and 4 ♂♂, 4 ♀♀, 1 deutonymph paratypes, surroundings of Carmona (near Seville, Spain), in the vicinity of Finca Alamaja, black soil from decayed plants, 22.02.1951, leg. H. Franz. All types in collection of Athias-Henriot deposited in MHNG.

Diagnosis. Male: excipulum absent; mobile digit of chelicera with 1 tooth, fixed digit with subapically located 6 denticles plus one (Fig. 8 A,B); hypostome extended between corniculi. Female: presternal plate with anterior margin serrated; endogynium circular in outline with two prolongations of posterior margin reaching anterior edge of endogynium, lateral sides of endogynial sack with 1-2 denticles (Fig. 9 D).

Description. Male. Idiosoma. Cuticle yellow-brownish, moderately sclerotized. Setae on holodorsal shield from 36 µm (j1) to 13-15 µm in opisthonotal region.

Ventral side. Sternal shield reticulated, without a particular pattern; length of sternal setae 24 µm (st2) to about 36 µm (st1, st4). Genital lamina with large central rounded process (Fig. 8 H). Opisthogaster with 8-9 pairs of setae, their lengths about 20 µm. Simple gland pore behind coxae IV.

Gnathosoma. Tectum with three prongs, the median much larger and broader than lateral ones (Fig. 8 D). Hypostome extended between corniculi; hypognathal groove provided with 9 rows of very fine denticles; hypostomatic and palpcoxal setae simple. Sclerotized cuticle with incisions behind hypostomatics; internal malae covered by a trapezoidal extension (Fig. 8 E). Corniculi slender and conical (Fig. 8 F).

Chelicera (Fig. 8 A-C). Fixed digit straight and narrow, its apex slightly curved; along its upper third, internal paraxial edge provided with 6 small denticles and antiaxial edge only with one big tooth; pilus dentilis located between these two edges. Movable digit with big tooth medially on internal margin and a characteristic rounded

hump on external (ventral) margin. Spermatotreme slender, ending distally at the level of tooth: the basal part of the digit with well sclerotized enlargement and a little denticle. Arthrodial membrane developed into brush-like process.

Pedipalps. Trochanter with protuberance located between slightly pilose setae v1 and thick and pilose v2; femur provided with small rounded protuberance, seta al slightly spatulate (Fig. 8 G).

Legs. Distal margin of coxa I dentate, coxa II with ridge bearing 7-8 denticles and an extra basal denticle (Fig. 8 I,J). Spurs on leg II as in figure 8 K: femoral apophysis short and thumb-like and axillary process trapezoidal; triangular spur located distally on genual margin; tibial apophysis elongated, situated medially on anterolateral face. Measurements: tarsus I = 159-169 μm ; tarsus IV = 164-169 μm .

Female. Idiosoma. Colour yellow-brownish; setae on podonotal region from 46 μm (j1) to 26 μm ; setae on opisthonotal region shorter, ca. 13 μm .

Ventral side. Presternal plate entire, ribbon-like, with the anterior margin serrated; lateral presternal platelets free. Sternal shield reticulated with a longitudinal granular strip medially (Fig. 9 A), length of sternal setae about 52 μm . Paragynial shields reticulated, metagynial sclerites oval (Fig. 9 B). Epigynium heptagonal, its anterior margin with triangular median apex and two lateral prominent spines: subapical epigynial structure formed by a weakly sclerotized rectangle and a hyaline structure stretching beyond epigynial margin in the form of two little wings (Fig. 9 C). Endogynium cup-shaped and circular in outline. Its posterior margin protrudes forward to form two long, sinuous prolongations with rounded tips reaching anterior edge of endogynial sack; lateral sides with 1-2 denticles (Fig. 9 D). Opisthogastric shield with 9 pairs of setae, their length from 42 μm (Zv1) to 24 μm (Jv5).

Gnathosoma. Tectum trispinate with long median prong and two tiny lateral prongs; dorsal face slightly granular (Fig. 9 E). Hypognathal groove with 9-10 rows of denticles, last four oligodentate; palpecoxal seta pilose, anterior hypostomatic seta slightly barbed, posterior setae simple (Fig. 9 F).

Pedipalps (Fig. 9 G). Border of trochanter thickened between pilose setae v1 and v2; distal margin of femur with small tubercle. Chelicera (Fig. 9 H) similar to that of *H. ellipticus*: fixed digit with five teeth and a long, thin cuticular ridge, movable digit with three teeth.

Legs. Structure and setation unremarkable. Denticulate ridge on coxa II as in the male (Fig. 9 I). Measurements: tarsus I = 156-163 μm ; tarsus IV = 173-185 μm .

Discussion. Adults of *H. gibber* are similar to those of *H. mallorcae* and of *H. ellipticus*. All these species have in common: denticulation of the anterior margin of the female's presternal shield, the shape of the endogynium and the pattern of male's second leg armature; but they differ mainly in the shape of the male's chelicera and tectum as well as in the form of the female's epigynium. See comments following the description of *H. ellipticus*.

Holoparasitus ellipticus sp. n.

Figs. 10, 11

Type material: 1 ♂ holotype, 11 ♂♂, 9 ♀♀ paratypes, Milazzo, Sicily, Italy from litter of olive trees, 24.03.1972; 1 ♂, 2 ♀♀ paratypes, Monti Peloritani, Sicily, from humus and litter in

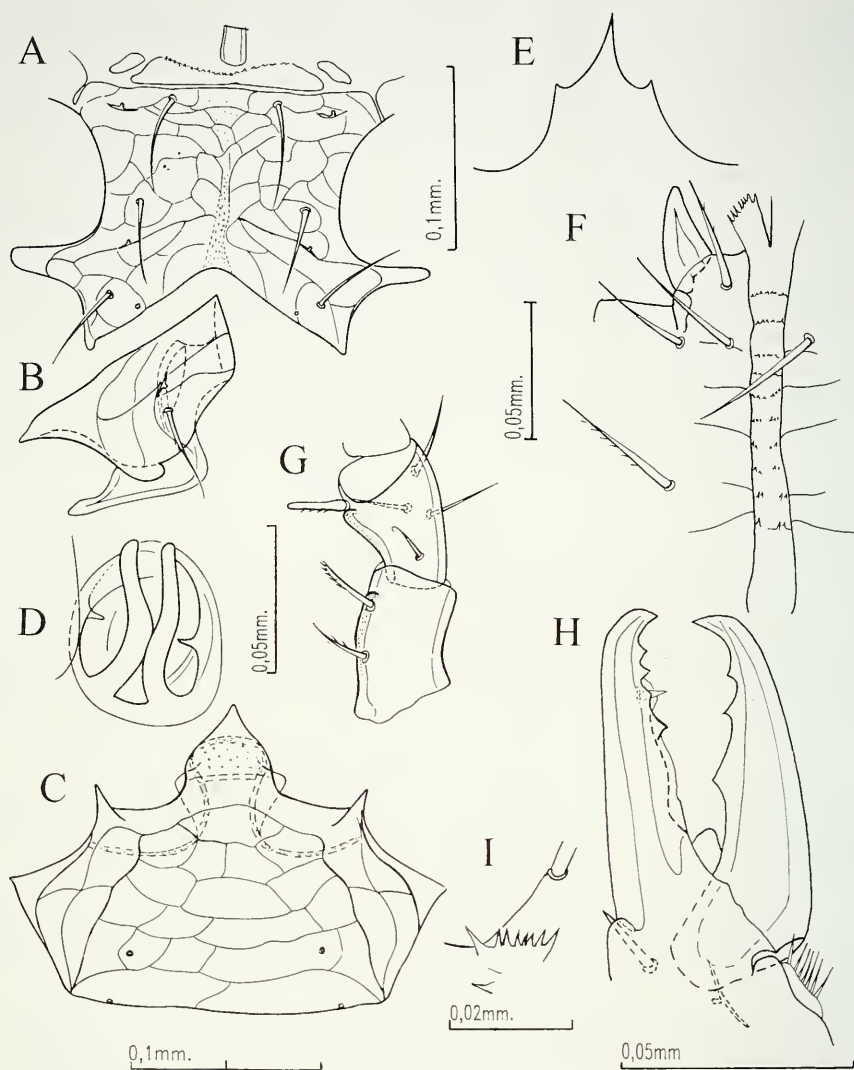


FIG. 9

Holoparasitus gibber sp. n. Female: A-presternal and sternal shields; B-paragnathum; C-epigynum; D-endogynium; E-tectum; F-hypognathal groove and corniculus; G-palptrochanter and palpfemur; H-chelicera, paraxial; I-coxa II, denticulate ridge.

oak forest, 26.03.1972. The material was collected by the staff of the DEBS. The holotype and 3 ♂♂, 6 ♀♀ have been deposited in MHNG, whereas 9 ♂♂, 5 ♀♀ in ZMJU.

Diagnosis. Male: excipulum absent; mobile and fixed digits of chelicera with many denticles (Fig. 10 D.E); hypostome evidently extended between corniculi.

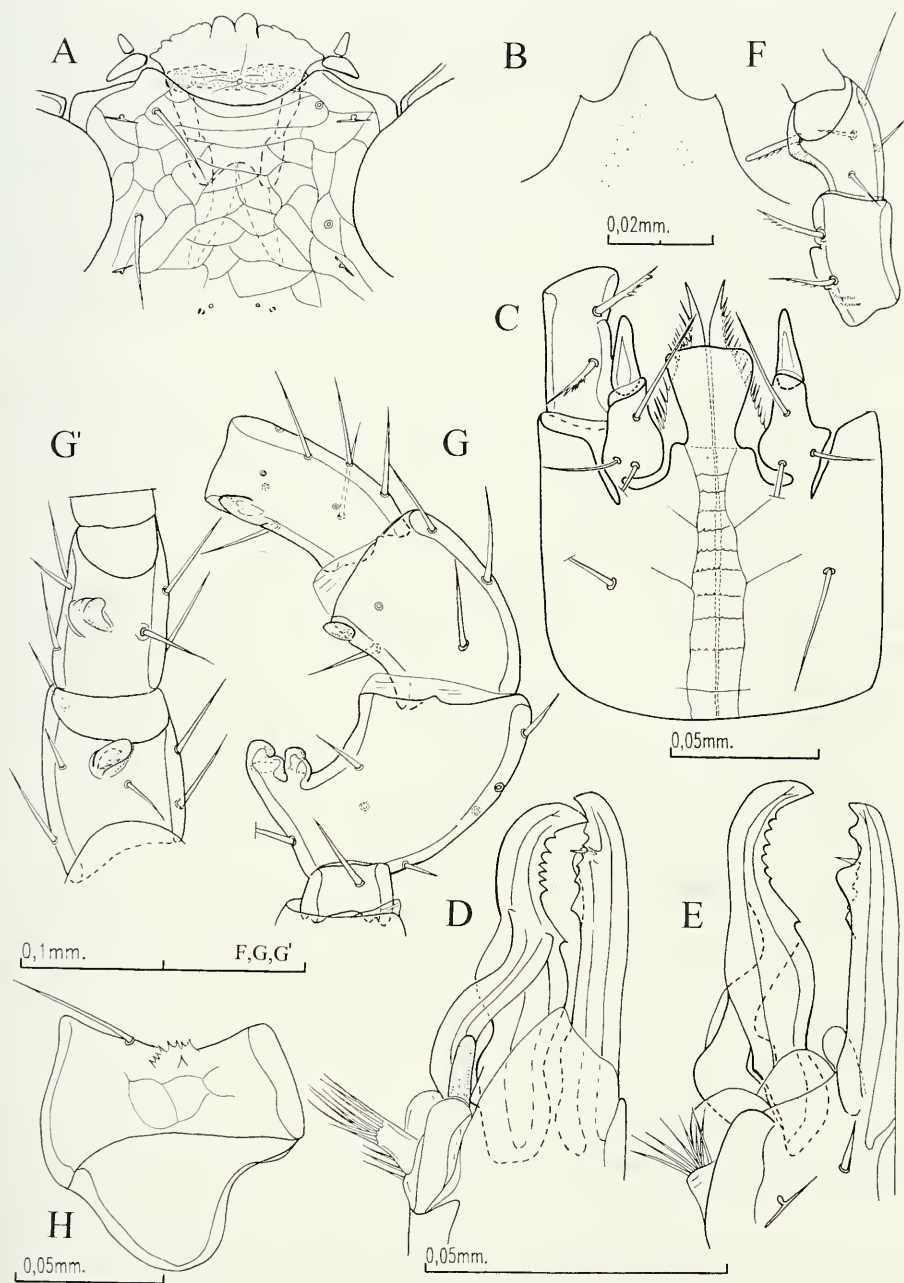


FIG. 10

Holoparasitus ellipticus sp. n. Male: A-genital lamina and sternogenital shields; B-tectum; C-gnathosoma and corniculi; D-chelicera, paraxial; E-idem, antiaxial; F-palptrochanter and palpfemur; G-G'-leg II, femur, genu and tibia antiaxial and ventral; H-coxa II, paraxial.

Female: presternal shield with anterior margin serrated; endogynium circular in outline; its posterior margin protrudes forward to form two prolongations ending beyond the anterior margin of endogynial sack; endogynial margin and walls with 3-7 denticles (Fig. 11 D).

Description. Male. Idiosoma markedly elongated, moderately sclerotized. Dimensions of idiosoma: 615-655 x 390-410 μm (L/W factor 1.57-1.64, N=10). Length of setae: podonotal region 15-20 μm , j1=39 μm and opisthonotal region 10-13 μm .

Ventral side. Genital opening located in a shallow concavity of sternal shield margin. Genital lamina divided into three lobes: central one bilobate, protruding forward more than lateral ones (Fig. 10 A). Sternogenital region with regular reticulation; length of sternal setae 39 μm . Cuticle around gland pores behind coxae IV not modified.

Gnathosoma. Tectum trispinate, with all lateral prongs terminated with minute spines; central prong rounded (Fig. 10 B). Hypostome with conspicuous broad extension located between slender corniculi. Hypognathal groove with 10 rows of denticles. Palpcoxal setae pilose, hypostomatic setae simple. Incisions in sclerotized cuticle behind hypostomatic setae (Fig. 10 C).

Chelicera (Fig. 10 D,E). Fixed digit slender; its proximal 3/5 toothless, with parallel edges; distal part equipped with 4-5 small denticles paraxially, and pilus dentilis inserted in the vicinity of two more or less pronounced tubercles. Movable digit curved, bearing 5-7 denticles distally and large tooth medially; dorsal face of digit weakly sclerotized proximally. An elongated protuberance located paraxially at the base of spermatotreme. Arthrodial membrane with brush-like process developed paraxially, synarthrodial membrane rounded.

Pedipalps (Fig. 10 F). Paraxial border of trochanter slightly thickened, visible as a ridge, ending near seta v1; seta v1 thin and barbed along one edge, whereas seta v2 thick and richly pilose. Ventral surface of femur convex.

Legs. Legs I, III and IV unremarkable. Leg II spurred as follows (Fig. 10 G,G'): main spur on femur relatively short and rounded, axillary spur rounded and located close to main spur, both spurs end at the same level. Genu II with conical spur located distally and extending slightly beyond distal margin. Spur on tibia longer than that on genu, situated more paraxially and attached to tibia surface over a long distance. Ridge of 8 denticles and one solitary denticle on coxa II (Fig. 10 H). Measurements: tarsus I = 160-168 μm ; tarsus IV = 173-184 μm .

Female. Idiosoma elongated but highly convex, cuticle moderately sclerotized, yellow to yellowish-brown. Dimensions of idiosoma: 690-770 x 465-540 μm (L/W factor 1.43-1.52, N=10). Podonotal setae: j1 = 45-46 μm , the others 20-39 μm ; opisthonotal setae shorter, 10-14 μm .

Ventral side. Presternal plates entire, ribbon-like, with denticulate anterior margin; lateral presternal platelets free. Exopodal shields facing legs I with thickened anterior edge and connected to sternum via thin cuticle. Reticulation of sternum weakly pronounced, more visible in anterior region; posterior region with an axially running granulate strip (Fig. 11 A). Length of sternal setae from 52 μm to 59 μm .

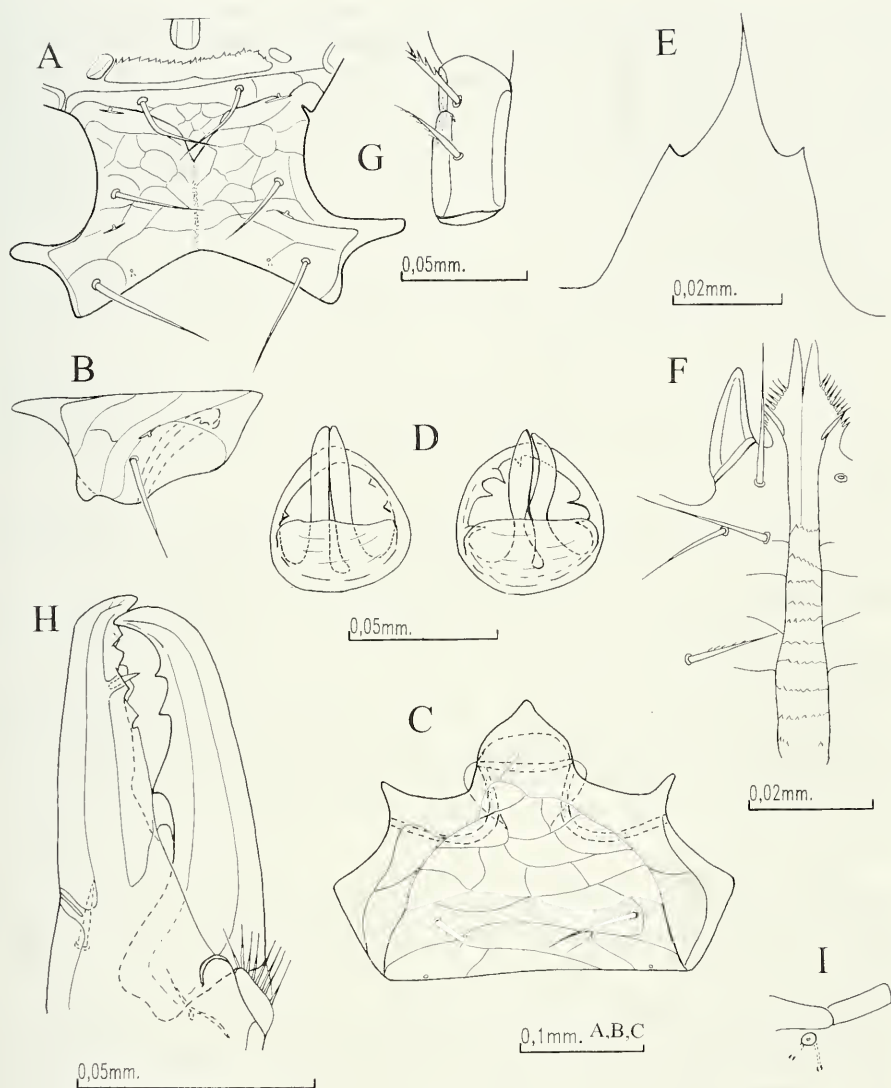


FIG. 11

Holoparasitus ellipticus sp. n. Female: A-presternal and sternal shields; B-paragynium; C-epigynum; D-endogynium; E-tectum; F-hypognathal groove and corniculus; G-palptrochanter; H- chelicera, paraxial; I-gland gv2.

Epigynum characterised by sharp lateral spines separated from central apex by deep concavities; lateral protrusions of subapical epigynial structure extending slightly beyond epigynum margin (Fig. 11 C). Paragynial shields with oval and slightly concave metagynial sclerites; thickenings in front of coxae IV absent. Paragynial

protrusions “locking” epigynial shield variable, ranging from ones with border paraxially angular to circular ones (Fig. 11 B). Cup-shaped endogynium circular; its posterior margin protrudes forward to form two slightly sinuous, tongue-like ribbons ending beyond anterior margin of endogynium; endogynial margin and walls armed with several (3-7) denticles, distributed more or less regularly. Endogynial opening covered with delicate lamina (Fig. 11 D). Opisthogaster with 8 pairs of setae, their length from 36 μm to 48 μm . Large, singular gland pores behind coxa IV surrounded by unmodified cuticle (Fig. 11 I).

Gnathosoma. Tectum trispinate, with long, attenuate median tine (Fig. 11 E). Hypognathal groove with 10 rows of denticles. Palpcoxal setae pilose, hypostomatic setae simple, corniculi conical (Fig. 11 F).

Chelicera (Fig. 11 H). Fixed digit with three teeth in front of pilus dentilis; sometimes central one smaller and located more paraxially. Pilus dentilis protected partially by truncated cuticular elevation; two teeth and a long, thin cuticular ridge located behind pilus dentilis. Movable digit with three teeth. Synarthrodial membrane rounded.

Pedipalps. Paraxial border of trochanter with a slightly thickened ridge, ending near pectinate seta v2, seta v1 pilose (Fig. 11 G). Anterolateral seta of femur spatulate and pectinate on one edge; genu with anterolateral setae simply spatulate.

Legs. Structure and setation unremarkable. Coxa II provided, on anterolateral face, with ridge of fine denticles plus one solitary denticle. Measurements: tarsus I = 164-168 μm ; tarsus IV = 173-183 μm .

Discussion. *H. ellipticus* is very similar in morphology to *H. gibber*, as well as to four known species: *H. siculus* (Berlese, 1906), *H. mallorcae* Juvara-Bals, 1975, *H. maritimus* Hyatt, 1987 and *H. lawrencei*, Hyatt, 1987. These six species likely form a monophyletic species-group, which we name *mallorcae* group with characteristics listed below.

The males can be distinguished mainly due to: sternogenital shield without excipulum; hypostome (hypostomatic setae on distinct piece of cuticle, hypostome more or less evidently extended between corniculi); leg II (spur on femur relatively short).

The females share similar features for: presternal plates (anterior margin serrated, lateral platelets free); endogynium (cup-shaped, circular, with two prolongations from posterior margin); structure of genital shields (paragynia devoid of thickening in front of coxa IV, similar pattern of subapical epigynial structure); structure of chelicera (3 and 5 denticles on movable and fixed digits, respectively).

Differential diagnosis of the *Holoparasitus mallorcae* species-group.

Male:

1. corniculi indented, tectum with 3 prongs; mobile digit of chelicera with 4-6 denticles; fixed digit denticulated: *H. mallorcae* Juvara-Bals, 1975
2. corniculi indented, tectum with 1 prong; mobile digit of chelicera curved, enlarged in its upper third with 6 small denticles; fixed digit slender, truncate apically, with 2-3 denticles on inner margin: *H. siculus* (Berlese, 1905)

3. corniculi indented, tectum triangular; mobile digit of chelicera with 5 small denticles distally and 1 larger proximally; fixed digit slightly curved apically with 7-8 denticles : *H. maritimus* Hyatt, 1987
4. corniculi conical; mobile digit of chelicera with 6-7 denticles, its dorsal margin weakly sclerotized proximally, sclerotized microsclerite near basis of spermatotrema; fixed digit slender with one teeth and 7 denticles around pilus dentilis : *H. ellipticus* sp. n.
5. corniculi conical; mobile digit of chelicera with 1 tooth on internal edge and with one large protuberance on external edge of digit; fixed digit slender with 4 denticles and little tooth around pilus dentilis: *H. gibber* sp. n.
6. corniculi conical, mobile digit of chelicera with 1-2 teeth on internal edge; fixed digit edentate, finger-like: *H. lawrencei* Hyatt, 1987

Female:

1. apex of epigynium elongated: *H. siculus* (Berlese, 1905)
2. apex of epigynium normal; endogynium without teeth, endogynial margin prolongations arcuate: *H. maritimus* Hyatt, 1987
3. apex of epigynium normal; endogynium without teeth, endogynial margin prolongations straight: *H. mallorcae* Juvara-Bals, 1975
4. apex of epigynium normal; endogynium with two teeth, prolongations sinuous: *H. gibber* sp. n.
5. apex of epigynium normal; endogynium with several teeth, prolongations sinuous: *H. ellipticus* sp. n.
6. apex of epigynium enlarged with little tip medially; endogynium with many internal teeth, prolongations curved, usually with denticles or corrugations at the end: *H. lawrencei* Hyatt, 1987

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